Calculation of porosity of sample described in Example 1 of patent US 4613535

Given in example 1:

Weight % Fiber:	Φ_f	0.727
Areal density of pressed plate: (AD)	AD	8.53 kg/m^2
Thickness of pressed plate	T	0.36 inch = 0.00914 m

Densities of constituents:

PE fiber	ρ_{PE}	975 kg/m^3
Kraton D1107	ρ_{KR}	940 kg/m^3

Density of composition without voids:

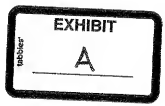
$\rho_{NO\_VOID} = 1/(\Phi_f / \rho_{PE} + (1- \Phi_f)/ \rho_{KR}) =$ 965.2 kg/m^3

True density of composition in example 1:

$\rho_{TRUE} = AD/T =$ 932.9 kg/m^3

Porosity of composition in example 1:

$\rho_{NO\_VOID}/ \rho_{TRUE} -1 =$ 0.0335 = 3.35%



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Product specification sheet: technical information

General information

Product: Stamylex – dense polyethylene film

Description:

Application:

Typical properties:

Note:

Technical data (typical values)

Property		Typical value
Thickness		0.007 mm
Weight		6.5 g/m²
Elmendorf tear resistance (ASTM D1922)	TD	70 g/µ

MD = machine direction
TD = transversal direction

EXHIBIT
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DSM Solutech

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DSM

— Product Data Sheet —

Solupor®: 3P07A

Microporous Polyethylene Film

Features

Thin, highly porous film with high pore size.

Applications

Substrate film for composite membranes (example : PEMFC)

Chemical Composition

Polymer	(Ultra) High Molecular Weight Polyethylene

General Properties

	Value	Unit	Test Method
Total Weight per Surface Area	*3.0*	g/m^2	MV 001
Thickness	*20*	µm	MV 002
Porosity	*83*	%	MV 001
Air Permeability, Gurley number	*1.4*	s/50 ml	MV 006
Mean Flow Pore Size	*0.7*	µm	MV 003

Additional Properties

	Value	Unit	Test Method
Tensile Strength @ Machine Direction	*12*	MPa	MV 010
Elongation at Break @ Machine Direction	*13*	%	MV 010
Dimensional Changes @ 80 °C			
- Machine Direction	*< 2*	%	MV 009
- Transverse Direction	*< 3*	%	MV 009

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